



**Annual Report to Congress**

**on the Safety and Security of Russian**

**Nuclear Facilities and Military Forces**

**December 2004**

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# Scope Note

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Congress has directed the Director of Central Intelligence (DCI) to submit to the Congressional leadership and intelligence committees an annual, unclassified report assessing the safety and security of the nuclear facilities and military forces in Russia. Congress has requested that each report include a discussion of the following:

- The ability of the Russian Government to maintain its nuclear military forces.
- The security arrangements at Russia's civilian and military nuclear facilities.
- The reliability of controls and safety systems at Russia's civilian nuclear facilities.
- The reliability of command and control systems and procedures of the nuclear military forces in Russia.

This report is the fourth responding to this Congressional request. The report addresses facilities and forces of the Russian Ministry of Defense, the Federal Agency for Atomic Energy (formerly the Ministry of Atomic Energy), and other Russian institutes. It updates the February 2002 report to Congress.

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*This paper has been prepared under the auspices of the National Intelligence Officer for Weapons of Mass Destruction and Proliferation.*



## Key Points

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The United States continues to work cooperatively with Moscow to increase the safety and security of nuclear-related facilities, infrastructure, and personnel. Russia is upgrading its physical, procedural, and technical measures to secure its *nuclear weapons* against both external and internal threats. Russia's nuclear security has been slowly improving over the last several years, but risks remain. We remain concerned about vulnerabilities to an insider who attempts unauthorized actions as well as potential terrorist attacks.

- An unauthorized launch or accidental use of a Russian nuclear weapon is highly unlikely as long as current technical and procedural safeguards built into the command and control system remain in place and are effectively enforced. Our concerns about possible circumvention of the system would rise if central political authority broke down.

Since the September 2001 terrorist attacks in the United States, President Putin and other Russian officials have conducted a public campaign to provide assurances that terrorists have not acquired Russian nuclear weapons. Russian officials have reported, however, that terrorists have targeted Russian nuclear weapon storage sites. Security was tightened in 2001 after Russian authorities twice thwarted terrorist efforts to reconnoiter nuclear weapon storage sites.

Russian facilities housing *weapons-usable nuclear material* vary from small research facilities and fuel cycle facilities to those involved with nuclear weapons research, development, and production. Small research facilities, although typically under-funded, usually have smaller, static inventories of weapons-usable nuclear material and are easier to secure whereas large fuel fabrication facilities have larger, varying inventories that are more difficult to account for and are much harder to secure.

We assess that progress on security enhancements is most advanced at civilian institutes and Russian Navy sites. Progress is impeded at facilities within the Federal Agency for Atomic Energy<sup>1</sup> nuclear weapons complex, which contain most of the material of proliferation interest because Russian security concerns prevent direct US access to sensitive materials. Russia's nuclear material protection, control, and accounting practices have been slowly improving over the last several years, but risks remain.

We find it highly unlikely that Russian authorities would have been able to recover all the material reportedly stolen. **We assess that undetected smuggling has occurred, and we are concerned about the total amount of material that could have been diverted or stolen in the last 13 years.**

As for security at nuclear power plants, the commander-in-chief of the Interior Ministry Force said in November 2003 that Russia would set up a special-purpose unit tasked to protect nuclear energy industry installations. The unit would be established to counter terrorists and augment existing security. Even with increased security, however, Russian nuclear power plants almost certainly will remain vulnerable to a well-planned and executed terrorist attack.

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<sup>1</sup> Formerly the Ministry of Atomic Energy (Minatom).



# Discussion

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The United States is working cooperatively with Moscow to increase the safety and security of nuclear-related facilities, infrastructure, and personnel. The Russian Ministry of Defense (MOD) is responsible for the nuclear military forces and its nuclear weapon storage system. The Federal Agency for Atomic Energy (Rosatom), formerly known as the Ministry of Atomic Energy,<sup>2</sup> operates the national nuclear weapons complex, conducts weapons-related tests at the MOD nuclear test site, and controls most nuclear-related institutes and industrial facilities.

- Rosatom and Rosenergoatom, a state-owned nuclear power concern, operate Russia's nuclear power reactors.<sup>3</sup>

We are concerned that Russia may not be able to sustain US-provided security upgrades of facilities over the long-term given the cost and technical sophistication of at least some of the equipment involved.

## Ministry of Defense

### Nuclear Weapons Inventory

Russia is upgrading its physical, procedural, and technical measures to secure its weapons against both external and internal threats, and Russia's nuclear security has been slowly but

unevenly improving over the last several years. Risks remain, however, and we continue to be concerned about vulnerabilities to an insider who attempts unauthorized actions as well as potential terrorist attacks.

- An unauthorized launch or accidental use of a Russian nuclear weapon is highly unlikely as long as current technical and procedural safeguards built into the command and control system remain in place and are effectively enforced. Our concerns about possible circumvention of the system would rise if central political authority broke down.

Since the dissolution of the Soviet Union, Moscow has consolidated the former Soviet stockpile into storage sites in Russia. Russian officials have stated that thousands of nuclear warheads from the former Soviet stockpile have been dismantled since 1991; reportedly over 10,000 warheads have been eliminated. Moscow relies on nuclear weapons as its primary means of deterrence, however, and will continue to have thousands of nuclear warheads in its inventory for the foreseeable future.

- Moscow maintains roughly 4,000 operational strategic nuclear warheads in its strategic nuclear triad, which is composed of ICBMs, submarine-launched ballistic missiles, and heavy bombers carrying nuclear-tipped air-launched cruise missiles. Moscow has agreed under the Moscow Treaty to reduce its strategic forces so that on 31 December 2012 Russia would have no more than 1,700 to 2,200 warheads.

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<sup>2</sup> For events that took place prior to March 2004, when the Ministry of Atomic Energy was reorganized, we continue to refer to the Ministry of Atomic Energy.

<sup>3</sup> In addition to the Russian Defense Ministry and Federal Agency for Atomic Energy, the United States Government works with the following Russian government organizations to improve nuclear warhead and material security: Rosenergoatom, the Russian Navy, the Russian Federal Inspectorate for Nuclear and Radiation Safety (Gosatomnadzor or GAN), and the Ministries of Interior, Education, and Economy.

- Although Russia has reduced its nonstrategic nuclear stockpile, it probably will retain several thousand nonstrategic nuclear warheads. In accordance with a 1991 unilateral pledge, Moscow consolidated most of its nonstrategic nuclear warheads in central depots and eliminated a major portion of them as a response to a US presidential initiative.

The Defense Ministry's 12<sup>th</sup> Main Directorate (GUMO) is responsible for the physical protection and safety of nuclear weapons. Specialists from the 12<sup>th</sup> GUMO carry out all maintenance work in close collaboration with the warhead designers. The 12<sup>th</sup> GUMO also is responsible for nuclear warhead shipments throughout Russia.

- All nuclear weapons storage sites, except those subordinate to the strategic missile troops, fall under the 12<sup>th</sup> GUMO's responsibility, thus facilitating a uniform policy in matters of operation and physical security.
- In peacetime all nuclear munitions except those on ICBMs and SLBMs on alert status are stored in nuclear weapons storage sites.
- The Russians employ a multi-layered approach that includes physical, procedural, and technical measures to secure their weapons.

Since the September 2001 terrorist attacks in the United States, President Putin and other Russian officials have conducted a public campaign to provide assurances that terrorists have not acquired Russian nuclear weapons.

- In October 2002, former Minister of Atomic Energy Adamov stated, "Neither Bin Ladin nor anyone else could steal a

nuclear warhead from anywhere in the former Soviet Union. During my time as minister, I carried out a comprehensive stock-taking of everything we had and had had, and traced the history of all the warheads ever produced. So, everything there was on the territories of the former USSR republics was returned to Russia. ...Nothing was stolen from us. So, neither Bin Ladin, nor Iraq nor Iran could make use of these explosive devices."

- Russian Defense Minister Sergei Ivanov said publicly during a visit to Washington in April 2004 that it is impossible for Moscow's stockpiles of nuclear weapons and nuclear fuels to fall into the hands of terrorists.

In September 2002, then First Deputy Chief of the General Staff, Colonel-General Baluyevskiy, stated that the security of Russian nuclear weapon storage sites "is important not only for our country but for the whole world. This is why they are heavily guarded. ...We have taken all measures to ensure the security of these facilities, from technical to physical ones."

Russian officials, however, have reported that terrorists have targeted Russian nuclear weapon storage sites. According to the chief of the 12<sup>th</sup> GUMO, Russian authorities twice thwarted terrorist efforts to reconnoiter nuclear weapon storage sites in 2002.

- In addition, two Chechen sabotage and reconnaissance groups reportedly showed a suspicious amount of interest in the transportation of nuclear munitions. The groups were spotted at several major railroad stations in the Moscow region, apparently interested in a special train used for transporting nuclear "bombs."



## Federal Agency for Atomic Energy

### Nuclear Materials Security

Russian facilities housing *weapons-usable nuclear material* vary from small research facilities and fuel cycle facilities to those involved with nuclear weapons research, development, and production.

- Small research facilities, although typically under-funded, usually have smaller, static inventories of weapons-usable nuclear material and are easier to secure; large fuel fabrication facilities have larger, varying inventories that are more difficult to account for and much harder to secure.

We assess that progress on security enhancements is most advanced at civilian institutes and Russian Navy sites. Progress is impeded at facilities within the Federal Agency for Atomic Energy<sup>4</sup> nuclear weapons complex, which contain most of the material of proliferation interest, because Russian security concerns prevent direct US access to sensitive materials.

- Russia's nuclear material protection, control, and accounting (MPC&A) practices have been slowly improving over the last several years, but risks of undetected theft remain.

In November 2002, Yuri Vishnevskiy, the head of the Russian Federal Inspectorate for Nuclear and Radiation Safety, Gosatomnadzor (GAN),<sup>5</sup> told a news conference that there

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<sup>4</sup> Formerly the Ministry of Atomic Energy (Minatom).

<sup>5</sup> In March 2004, the Federal Nuclear Regulatory Service replaced Gosatomnadzor (GAN). Two months later, this service was merged into a larger regulatory body known as the Federal Service for Environmental, Technological, and Nuclear Oversight. We are

### Weapons-Usable Nuclear Material

*Weapons-usable* nuclear material is defined as uranium enriched to 20 percent or greater in the uranium-235 or uranium-233 isotopes (highly enriched uranium, HEU) and any plutonium containing less than 80 percent of the isotope plutonium-238.

*Weapons-grade* material is typically defined as uranium enriched to about 90 percent or greater uranium-235 or uranium-233, or plutonium containing about 90 percent or greater plutonium-239.

have been documented instances of nuclear materials, including grams of weapons-grade uranium, disappearing from Russian nuclear facilities. He stated that losses most frequently occurred at nuclear materials processing facilities, including Elektrostal near Moscow and the Chemical Concentrates Plant in Novosibirsk.

- Subsequently Minister of Atomic Energy Rumyantsev acknowledged missing material but claimed that "Everything that was lost was subsequently traced and returned to the relevant arsenals. It may not have been instantly, it may have taken several years, but all these thefts were carefully investigated and prevented."
- We find it highly unlikely that Russian authorities would have been able to recover all the stolen material.

Last year GAN continued to find inadequacies in the accounting system for Russian nuclear materials. Its press release in August 2003 said, "In connection with the lack of

- concerned this reorganization may not provide for the same level of scrutiny as GAN did. (U)

development in creation of a system of state accounting and control of nuclear materials, a significant number of deviations from the normative requirements have been noted, there are anomalies in accounting for nuclear materials, and shortcomings of an organizational nature in the operating organizations have been noted.”

- In March 2003, a memorandum issued by GAN and circulated in the Duma, stated that “The analysis of inspections carried out last year shows that there are serious flaws in the physical protection of nuclear risky facilities in the industry....The system of accounting, control, storage and transportation of radioactive materials is not fully operational yet. As a result, the unauthorized use of radioactive materials and their theft cannot be ruled out.”

***Detected Diversions.*** Russian institutes have lost weapons-grade and weapons-usable nuclear materials in thefts in amounts greater than a few milligrams, contrary to claims by Minatom officials. In each case that we know about, however, the diverted material eventually was seized by government authorities. For example,

- In 1992, 1.5 kilograms of 90-percent-enriched weapons-grade uranium were stolen from the Luch Production Association.
- In 1994, approximately 3.0 kilograms of 90-percent-enriched weapons-grade uranium were stolen in Moscow.
- In 1999, the US Government confirmed that a Bulgarian seizure of nuclear material was weapons-usable. The material—approximately four grams of HEU—probably originated in Russia.

Although not independently confirmed, reports of a theft in 1998 from an unnamed enterprise in Chelyabinsk Oblast are of concern. The chief of the Federal Security Service department in the Chelyabinsk region reported the prevention of the theft of 18.5 kilograms of radioactive materials. Viktor Yerastov, then chief of Minatom’s Nuclear Materials Accounting and Control Department, without admitting to an amount being stolen, said that “if” that amount had been stolen, it was “quite sufficient material to produce an atomic bomb”—the only nuclear theft that has been so described.

There have been other press reports about materials seized in Russia about which we have no further information because Russia typically does not reveal the results of its investigations. Press reports generally overstate the impact of stolen material, often referring to or implying that depleted, natural, or low-enriched uranium are weapons-grade or weapons-usable material.<sup>6</sup>

The number of seizures of stolen material and reported theft attempts over the last several years has declined as a result of several possible factors: US assistance to improve security at Russian facilities, a possible decrease in smuggling, or smugglers more knowledgeable about evading detection. Nevertheless, we assess that undetected smuggling has occurred, and we are concerned about the total amount of material

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• <sup>6</sup> In contrast, non-weapons-grade nuclear material thefts, particularly containers of such radionuclides as cesium-137, cobalt-60, or strontium-90, have been frequent and well documented. Although terrorists could use these radionuclides to build a radiological dispersal device—designed to disperse radioactive material to cause injury and contamination by means of the radiation—we assess that in the majority of these cases thieves were seeking the metal used in the container shielding rather than the radioisotope.

that could have been diverted over the last 13 years.

### **Safety and Security at Russian Civilian Nuclear Power Plants**

Russia has announced plans to begin construction of reactors with enhanced safety features, but the funding has not yet been allocated. Consequently Russia will have to extend the lives of the first-generation plants, presenting some risk to the safety of individuals living near them.

- Seven first-generation Russian nuclear power reactors will reach the end of their service lives within the next four years.
- A major continuing problem for the Russian nuclear power industry is the failure of its customers to pay for electricity, which has contributed to a lack of resources for maintenance, spare parts, and salaries.

Western assistance has been improving the safety systems and operating procedures at Soviet-designed nuclear reactors. However, inherent design deficiencies in RBMK and older model VVER reactors will prevent them from ever meeting Western safety standards.

- The most notable design flaw in these reactors is the lack of a Western-style containment structure to prevent the release of fission products in the event of a serious accident

In March 2003, Atomic Energy Minister Rumyantsev stated that since September 2001 “We have drawn up and implemented a number of measures which guarantee the necessary safety of our installations.”

- Even with increased security, however, Russian nuclear power plants almost certainly will remain vulnerable to a well-planned and executed terrorist attack, which could cause significant damage or even a radiological release.